

Protect against multiple hazards of welding

A recent item in *Along the Coast* (CFN August 2007) reporting medevacs of two fishermen due to eye injuries reminded me of my 2001 visit to the Hyundai container-ship manufacturing and assembly plant in Pohang, South Korea.

My host was a Korean occupational medicine physician who was making a work-site visit as Hyundai's occupational safety consultant. I had the privilege of taking a tour of the plant while he discussed safety with workers and line managers.

As we rounded one bend, I noticed a single worker, high up amid the steel, welding the side of a bulkhead to the steel spine to make a container space. It appeared that he was welding in a confined space because he was facing a corner with reflective surfaces on both

sides of him and was without additional ventilation. The intense light and sparks flying everywhere reminded me he was being exposed to particles, sparks, fumes, and radiation.

The good news was that, at the Hyundai plant, as in many other large corporations, there was a safety consultant on site and safety policies were in place. Adherence to KOSHA regulations (Korean Occupational Health and Safety Administration) was required, as was use of appropriate personal protective equipment, training, and monitoring.

In contrast, welders working here in a small shop or boatyard or fishermen welding on their vessels are more vulnerable and at risk. That's because they are less likely to have appropriate eye and body protection, proper training, or supervision.

Welding hazards

We are all familiar with the obvious and observable welding hazard of intense visible light. This exposure is extremely dangerous to the eyes because it can penetrate the cornea and lens of the eye and permanently damage the retina at the back of the eye.

Both infrared light and ultraviolet radiation (UVR) are present as well. The infrared can cause heat damage and the UVR can damage the cornea.

Mechanical exposures such as grit and sparks also are a major contributor to welding injuries and illness, as is "manganism," a toxic condition with symptoms similar to Parkinson's Disease that can be brought on by chronic exposure to manganese.

Therefore, the use of the right personal protective gear when welding is extremely important.

Shading levels

When welding, wear a helmet with a shield and also wear goggles or safety glasses with side protectors. The goggles or safety glasses are worn under the helmet to protect from particles and spatter when you lift the shield to brush-off and inspect the weld.

The shield must be tinted or shaded in order to stop UVR and cut the brightness of the visible light. The appropriate shade numbers can be found online at www.osha.gov.

The shade numbers range from three to 14. For example, during shielded metal arc welding using 3" to 5-1/32" electrodes and an arc current of 60, the minimum protective shade is eight.

The word "minimum" is key because safety professionals suggest using the darkest possible shade that allows the welder to see the work clearly.

If the welder is using shaded safety glasses or goggles, the helmet only needs to be shaded enough to bring the total of the two shade numbers to the minimum shade specified.

other than the eyes. To reduce this risk, wear cotton – not synthetic – clothing and UV protective gloves on the hands.

The Consumer Product Safety Commission warns that these precautions, including the eye protection, apply to other people who are working near the welder because they are similarly at risk for burns and eye damage.

Location, location

When the welding is taking place in a boatyard, on a dock, or on a fishing vessel, there are other dangers present. Terry Byrd, a welding product manager for Airgas Inc., stated in the March 2006 issue of *Occupational Health and Safety* that "Welding when wet increases the risk of shock, so workers should 'weld dry.'"

To stay dry, Byrd suggests "using dry rubber mats, wood, plywood, or other insulating materials to prevent being the grounding source for the electricity."

FISH SAFE: WELDING

- Using OSHA regulations, determine appropriate eye protection and wear it.
- Take precautions to reduce exposure to fumes, particles, and sparks.
- Take stock of your work environment and guard against hazards such as electric shock.
- Develop your own personal

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To reduce exposure to fumes, ventilate the area and don't lean into the work. There is a risk of both UVR and mechanical burns to parts of the body

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- Using OSHA regulations, determine appropriate eye protection and wear it.
- Take precautions to reduce exposure to fumes, particles, and sparks.
- Take stock of your work environment and guard against hazards such as electric shock.
- Develop your own personal and crew protection plan and seek medical attention immediately in the event of a welding accident.

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